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representation of the observed angles and distances might be obtained by repeating the process upon which the above elements were deduced, but I defer any further computation in the hope of soon receiving measures made after the passage of the peri-astron.

Lord Lindsay's epoch, as used above, is,

1874·85 34°·17

If, for the annual parallax, a mean of Henderson's value, as corrected by Peters, and that of Moesta, be taken, giving 0″·928, we find the mass of this system = 1·79 × ⊙'s mass, and for the semi-axis major of the orbit 23·49.

Ephemeris for Determining the Positions of the Satellites of Uranus, 1877. By A. Marth, Esq.

(*Communicated by A. C. Ranyard, Esq.*)

Greenw. Noon. 1877.	p	Ariel.		Umbriel.		Titania.		Oberon.	
		log a	log b	log a	log b	log a	log b	log a	log b
Jan. 25	10·48	1·1811	0·7569	1·3251	0·9009	1·5400	1·1158	1·6662	1·2420
30	10·41	·1817	·7613	·3257	·9053	·5406	·1204	·6668	·2464
Feb. 4	10·34	·1821	·7656	·3261	·9096	·5410	·1245	·6672	·2507
9	10·27	·1823	·7697	·3263	·9137	·5412	·1286	·6674	·2548
14	10·21	·1823	·7736	·3263	·9176	·5412	·1325	·6674	·2587
19	10·14	·1822	·7772	·3262	·9212	·5411	·1361	·6673	·2623
24	10·07	·1818	·7806	·3258	·9246	·5407	·1395	·6669	·2657
Mar. 1	10·01	·1812	·7836	·3252	·9276	·5401	·1425	·6663	·2687
6	9·95	·1804	·7862	·3244	·9302	·5393	·1451	·6655	·2713
11	9·89	·1795	·7885	·3235	·9325	·5384	·1474	·6646	·2736
16	9·83	·1784	·7903	·3224	·9343	·5373	·1492	·6635	·2754
21	9·78	·1772	·7918	·3212	·9358	·5361	·1507	·6623	·2769
26	9·73	·1758	·7928	·3198	·9368	·5347	·1517	·6609	·2779
31	9·69	·1743	·7934	·3183	·9374	·5332	·1523	·6594	·2785
Apr. 5	9·66	·1727	·7935	·3167	·9375	·5316	·1524	·6578	·2786
10	9·63	·1710	·7932	·3150	·9372	·5299	·1521	·6561	·2783
15	9·61	·1692	·7925	·3132	·9365	·5281	·1514	·6543	·2776
20	9·60	·1673	·7913	·3113	·9353	·5262	·1502	·6524	·2764
25	9·59	·1654	·7896	·3094	·9337	·5243	·1486	·6505	·2748
30	9·59	·1635	·7878	·3075	·9318	·5224	·1467	·6486	·2729
May 5	9·60	1·1615	0·7854	1·3055	0·9294	1·5204	1·1443	1·6466	1·2705

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a and *b* are the major and minor semi-axes of the apparent orbits of the satellites, expressed in seconds of arc; p_o is the position-angle of the major axes. The longitudes ω of the satellites in their orbits, reckoned from the points of their greatest northern elongations, are the following:—

Greenwich,	Ariel.		Umbriel.		Titania.		Oberon.	
Noon.	ω	diff.	ω	diff.	ω	diff.	ω	diff.
	°	°	°	°	°	°	°	°
Jan. 25	168·28		330·37		19·65		248·04	
		714·16		434·32		206·72		133·67
30	162·44		44·69		226·37		21·71	
		·15		·31		·72		·66
Feb. 4	156·59		119·00		73·09		155·37	
		·15		·31		·72		·66
9	150·74		193·31		279·81		289·03	
		·14		·31		·72		·66
14	144·88		267·62		126·53		62·69	
		·13		·30		·72		·66
19	139·01		341·92		333·25		196·35	
		·13		·30		·72		·66
24	133·14		56·22		179·97		320·01	
		·12		·30		·72		·66
Mar. 1	127·26		130·52		26·69		103·67	
		·12		·30		·71		·66
6	121·38		204·82		233·40		237·33	
		·12		·29		·72		·66
11	115·50		279·11		80·12		10·99	
		·12		·30		·72		·66
16	109·62		353·41		286·84		144·65	
		·11		·29		·72		·67
21	103·73		67·70		133·56		278·32	
		·10		·30		·72		·66
26	97·83		142·00		340·28		51·98	
		·11		·29		·72		·67
31	91·94		216·29		187·00		185·65	
		·11		·30		·73		.67
Apr. 5	86·05		290·59		33·73		319·32	
		·11		·29		·72		·68
10	80·16		4·88		240·45		93·00	
		·10		·30		·73		·67
15	74·26		79·18		87·18		226·67	
		·11		·30		·73		·68
20	68·37		153·48		293·91		0·35	
		·11		·30		·74		·69
25	62·48		227·78		140·65		134·04	
		·11		·31		·74		·68
30	56·59		302·09		347·39		267·72	
		714·12		434·30		206·74		133·69
May 5	50·71		16·39		194·13		41·41	

These values must be interpolated for the times for which the position of the Satellites are required. The angles of position *p* and distances *s* are then found by means of the equations—

$$s \sin (p_o - p) = b \sin \omega.$$

$$s \cos (p_o - p) = a \cos \omega.$$

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The interpolation of the values of ω may be facilitated by the following tables, which give the motion of ω for every even hour of the five days' interval:—

Ariel, diff. = 714°·12.

	$0^{\rm d}$	$1^{\rm d}$	$2^{\rm d}$	$3^{\rm d}$	$4^{\rm d}$
h	°	°	°	°	°
0	0·00	142·82	285·65	68·47	211·30
2	11·90	154·73	297·55	80·37	223·20
4	23·80	166·63	309·45	92·28	235·10
6	35·71	178·53	321·35	104·18	247·00
8	47·61	190·43	333·25	116·08	258·90
10	59·51	202·33	345·16	127·98	270·81
12	71·41	214·24	357·06	139·88	282·71
14	83·31	226·14	8·96	151·79	294·61
16	95·22	238·04	20·86	163·69	306·51
18	107·12	249·94	32·77	175·59	318·41
20	119·02	261·84	44·67	187·49	330·32
22	130·92	273·75	56·57	199·39	342·22
24	142·82	285·65	68·47	211·30	354·12

Umbriel, diff. = 434°·28.

	$0^{\rm d}$	$1^{\rm d.}$	$2^{\rm d}$	$3^{\rm d}$	$4^{\rm d}$
h	°	°	°	°	°
0	0·00	86·86	173·71	260·57	347·42
2	7·24	94·09	180·95	267·81	354·66
4	14·48	101·33	188·19	275·04	1·90
6	21·71	108·57	195·43	282·28	9·14
8	28·95	115·81	202·66	289·52	16·38
10	36·19	123·05	209·90	396·76	23·61
12	43·43	130·28	217·14	304·00	30·85
14	50·67	137·52	224·38	311·23	38·09
16	57·90	144·76	231·62	318·47	45·33
18	65·14	152·00	238·85	325·71	52·57
20	72·38	159·24	246·09	332·95	59·80
22	79·62	166·47	253·33	340·19	67·04
24	86·86	173·71	260·57	347·42	74·28

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Titania, diff. = 206°·70.

h	0^{d}	1^{d}	2^{d}	3^{d}	4^{d}
	°	°	°	°	°
0	0·00	41·34	82·68	124·02	165·36
2	3·45	44·79	86·13	127·47	168·81
4	6·89	48·23	89·57	130·91	172·25
6	10·34	51·68	93·02	134·36	175·70
8	13·78	55·12	96·46	137·80	179·14
10	17·23	58·57	99·91	141·25	182·59
12	20·67	62·01	103·35	144·69	186·03
14	24·12	65·46	106·80	148·14	189·48
16	27·56	68·90	110·24	151·58	192·92
18	31·01	72·35	113·69	155·03	196·37
20	34·45	75·79	117·13	158·47	199·81
22	37·90	79·24	120·58	161·92	203·26
24	41·34	82·68	124·02	165·36	206·70

Oberon, diff. = 133°·68.

h	0^{d}	1^{d}	2^{d}	3^{d}	4^{d}
	°	°	°	°	°
0	0·00	26·74	53·47	80·21	106·94
2	2·23	28·96	55·70	82·44	109·17
4	4·46	31·19	57·93	84·66	111·40
6	6·68	33·42	60·16	86·89	113·63
8	8·91	35·65	62·38	89·12	115·86
10	11·14	37·88	64·61	91·35	118·08
12	13·37	40·10	66·84	93·58	120·31
14	15·60	42·33	69·07	95·80	122·54
16	17·82	44·56	71·30	98·03	124·77
18	20·05	46·79	73·52	100·26	127·00
20	22·28	49·02	75·75	102·49	129·22
22	24·51	51·24	77·98	104·72	131·45
24	26·74	53·47	80·21	106·94	133·68